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Poverty dynamics in Brazilian metropolitan areas: An analysis based on Hulme and Shepherd's categorization (2002–2011)

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Abstract

Ever-more sophisticated studies on the methodological approach and the conceptual scope of poverty have led to a consensus among scholars on the dynamic characteristic of this phenomenon – in other words, the existence of an in-and-out of privation movement of individuals and families. Within this context, Hulme and Shepherd (2003) defined five groups according to the location of the punctual and average indicators of poverty vis-à-vis the poverty line. This paper's objective is to adapt this typology to Brazil, using PME (Monthly Job Survey) micro-data for the 2002–2011 timeframe and the six Brazilian Metropolitan Regions covered by PME as well as, by estimating a multinomial logit, investigate which family characteristics relate to a greater or lesser chance of belonging to each of the chronic and transitory poverty categories. Categorization allows observation that, despite a sweeping across-the-board decline in the percentage of families in all poverty categories in the past decade, those families always or usually poor display demographic, socioeconomic, access to and insertion into the labor market categories which differ from families in transitory poverty or classified as never poor. Moreover, Northeastern metropolitan regions (Salvador and Recife) have higher percentages of chronic or transitory poverty. Multinomial logit estimates make it possible to verify that families whose members have completed secondary schooling or college or hold a higher-qualified occupation stand lesser chances of entering into or remaining in poverty. Results call for differentiating among poor families, as they enter into or leave poverty – which is tantamount to saying that the dynamics of poverty must be taken into account as public policies are drawn up.

JEL classification: I32; I31; D3

Keywords: Poverty dynamics; Chronic poverty; Transitory poverty; Multinomial logit

Resumo

Com o desenvolvimento de estudoscadavezmaissofisticadosemtermos da abordagemmetodológica e da abrangência do conceito de pobreza, pesquisadoreschegarama um consensosobre a característicadinâmica do fenômeno, ouseja, a existência de um movimento de saída e entrada de indivíduos e famíliasnasituação de privação. Nessecontexto, Hulme e Shepherd (2003) definemcincogrupos de acordo com a localização do indicadorpontual e do indicadormédio de pobrezaemrelação à linha de

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pobreza. O objetivo do presentetrabalho é adaptartaltipologia para o Brasil, pormeio da utilização dos microdados da Pesquisa Mensal de Emprego (PME), para o período de 2002 a 2012 e as seisregiõesmetropolitanascobertas pela PME, e, pormeio da estimação de um logit multinomial, investigarquaissão as características das famíliasrelacionadas a maioroumenor chance de pertencer a cadauma das categorias de pobrezacrônica e transitória. A categorizaçãopermiteobservarque, apesar da quedageneralizada da porcentagem de famíliasemtodas as categorias de pobrezanaúltimadécada, as famíliassempreouusualmentepobresapresentamcaracterísticasdemográficas, socioeconômicas e de acesso e inserção no mercado de trabalhodistintas das famílias com pobrezatransitóriaouclassificadascomonuncapobres. Além disso, as regiõesmetropolitanas do Nordeste (Salvador e Recife) apresentamporcentagensmaisaltas de pobrescrônicos e transitórios. Osresultadosindicam a necessidade de diferenciação das famíliaspobres, de acordo com o movimento de entrada e saída da pobreza, ouseja, que a dinâmica da pobrezasejaconsiderada no desenho de políticaspúblicas.

Palavras-chave: Dinâmica da pobreza; Pobrezacrônica; Pobrezatransitória; Logit multinomial

1. Introduction

Family privation is a phenomenon which has long interested researchers and public managers, but has become the core of academic debate and public policy formulation since the economic crisis in the 80s, as the Human Development Index (HDI) was created, the 90s and particularly in this century's opening decade, as income transfer programs aimed at poorer families were implemented and consolidated. In this time period, monetary privation, the various dimensions of poverty and poverty dynamics itself are measured by indicators not so much to quantify and focus on the issue but rather to formulate policies seeking to reduce privation.

Literature has advanced in distinguishing absolute from relative poverty; monetary from multidimensional poverty (Soares, 2009a; de Codes, 2008; Rocha, 2003) and in identifying the factors related to such phenomena (de Barros et al., 2006; Ribas et al., 2011; Machado et al., 2014).

In the case of socioeconomic phenomena associated to family privation, by using a methodological approach and different concepts, researchers have come to a consensus on the multi-dimensions and complexity of this social problem. However, something inherent to any social phenomenon (its dynamics) is, to this day, very little present in Brazilian literature on poverty. Even though Ribas et al. (2011) has sought to distinguish transitory from chronic poverty in Brazil, through cross-section data, and Machado and Ribas (2010) have shown factors associated to getting into or leaving poverty and, especially, how the market place as a whole affects the time families remain in poverty, such works are still few and far between. One reason for this is that we have only one longitudinal database for secondary data, namely, PME/IBGE's Jobs Monthly Survey, (PME/IBGE), as mobility studies of analysis unit require a long follow-up.

There are two distinct methodological ways to deal with poverty dynamics. First, through a *priori* probability calculations, known in literature as vulnerability to poverty (Jalan and Ravallion, 1998; Dercon, 1999; Chaudhuri, 2003; Ligon and Schechter, 2004; Ribas, 2007a; Gonçalves and Machado, 2014; Gonçalves, 2015). The second methodological approach seeks to break down transitory poverty's chronic dimension, while keeping open the possibility of approaching both aspects simultaneously.

It is possible in this context to highlight White and Killick's work (2001), developed to deal with this phenomenon's various forms of manifestation. These authors stress the importance of distinguishing between chronic poverty – understood as the state of poverty due to a convergence of factors such as the absence of political influence, few goods/assets, and lack of market access – from transitory poverty, that must be related to the incidence of shocks or greater vulnerability to shocks, such as problems in farm harvests, price fluctuations and diseases (White and Killick, 2001, p. 15).

Hence, Hulme and Shepherd (2003), aware of the need to distinguish the different forms of poverty, define five groups, according to the location of poverty's punctual and average indicators vis-à-vis the poverty line. This paper seeks to adapt such typology to Brazil's case, using PME (Monthly Job Survey) micro-data, from 2002 through 2011, and via income imputation from PNAD's (National Survey through Household Sampling)[1] non-work, for the six Brazilian metropolitan regions covered by PME. Moreover, estimating a multinomial logit leads to an investigation of

[1] Following the methodology used by Ribas and Machado (2008).

socioeconomic factors of families related to a greater or lesser chance of their belonging to one of the categories of chronic and transitory poverty.

This paper is organized into four sections, following this Introduction. Section 2 briefly summarizes the literature on categorizations in the context of poverty dynamics. Section 3 presents the methodologies applied. Section 4 describes the results and establishes a comparison with the results found by Hulme and Shepherd's article (2003) and Section 5 has some closing remarks.

2. The importance of poverty dynamics and of Hulme and Shepherd's categorization

The chief result of the extensive literature on poverty dynamics is to acknowledge the need of a time reference for this phenomenon and to emphasize it as the output of a dynamic process (Alwang et al., 2001, p. 7). Most studies on poverty dynamics consider the absolute poverty line, using lines based on family consumption. In the Brazilian case, even though Rocha's lines (1997) refer to consumption reported by the Family Budget Survey (POF/IBGE), studies use absolute lines defined according to family income (Ribas, 2007a, 2007b; Soares, 2009b; Ribas et al., 2011; Osorio et al., 2012).

Using these lines is justified because it is precisely the distinction between individuals or families always poor or poor in a given timeframe which allows a deeper dwelling on the poverty cycle buttressing this phenomenon (Bane and Elwood, 1986). These authors define poverty as income below a pattern of needs, whose calculation is based on family size, and define poverty cycle as a period starting when income drops below the poverty line, after having been above this same line and ends when income climbs above the poverty line, immediately after having been below it.

In order to calculate the likelihood (probability) of exiting poverty in the United States between 1970 and 1981, through a hazard rates approach and considering the time families remain in poverty, and to study the events associated to the start and the end of poverty cycles, Bane and Elwood (1986) verified that only a small fraction of individuals or families entering poverty in a given point in time is chronically poor, but families with long poverty cycles are a considerable part of the group of poor at any time and they consume most resources earmarked to attenuate privation.

Ravallion (1988), researching India between 1975 and 1983, and attempting to analyze the relation between aggregated risks jointly faced by rural families and reflected in the welfare level variance (consumption), and poverty (low welfare level), breaks down poverty into transitory and chronic, taking into account the period a family remained below the poverty line and the depth or severity of such downfall. For this author, persistently poor families are poor at any point in time. In other words, their welfare level is below the poverty line during the entire period of analysis, while transitory-poverty families are poor in at least one moment in time, but they are not continually poor.

A similar poverty breakdown is found in the studies of Jalan and Ravallion (1998, 2000), for China in 1985–1990. They attribute transitory poverty to an inter-temporal consumption variance, meaning that it is measured by the contribution of the welfare indicator in-time variability of the expected poverty and, for a family to be in transitory poverty, it must be at least one point in time in poverty and its standard of living must show variations during the analysis period.

Furthermore, the authors claim that transitory poverty is due to individuals' vulnerability to drops in their standard of living: non-poor individuals may suddenly fall into poverty and individuals not far below the poverty line can, all of a sudden, drop into extreme poverty (Jalan and Ravallion, 2000, p. 82). On the other hand, chronic poverty is defined as poverty persisting in time, even when the inter-temporal consumption variability diminishes. Lastly, inter-temporal poverty is the sum of poverty's chronic and transitory components.

In the context of distinguishing stochastic or transitory poverty and permanent or chronic poverty, Morduch's work (1994) must be cited. Concerned with the causal relation between the lack of safety mechanisms against shocks and the incidence of poverty, Morduch defines stochastic poverty as that which does not occur during the entire period of analysis, thus attributing stochastic poverty to a family if its current consumption is below the poverty line, located below the permanent or average income. In other words, the family is poor at a specific moment in time, yet its permanent income is above the poverty line. For this author, such phenomenon could be related to stochastic elements in a local economy or could be due to an impossibility to acquire loans due to credit market imperfections. On the other hand, structural poverty, linked to intrinsic family characteristics and/or incapacity to obtain sufficient income, is defined as a situation in which the family remains poor throughout the whole period of analysis. In other words, its current consumption and permanent income are both below the poverty line defined as the standard. Structural poverty could be associated to shocks in the family structure, which trigger a decline in the permanent income, and/or impossibility to access loans because of permanent low income, this fact leading to permanence in poverty for some time (Morduch, 1994).

Hence, the distinction among different profiles of demographic and socioeconomic groups about the oscillation in *per capita* family income around the poverty line, throughout a time series, must be analyzed in studies dealing with poverty dynamics. This differentiation must be considered whenever public policies are designed. Families always poor require, in addition to income transfer programs, to be qualified and enabled to work as well as policies to be integrated into the social networks. On the other hand, families facing episodic poverty in lean economic cycles – a situation most of the time plaguing autonomous freelance workers – may need greater access to credit programs. In considering then these different dimensions of poverty, the following section herein presents the methodology used to classify families as per Hulme and Shepherd's categorization (2003).

In the poverty dynamics approach, families are classified and clustered through specific and aggregate categorizations presented by Hulme and Shepherd (2003), in an adaptation of Jalan and Ravallion's work (2000), who broke down poverty into two categories only: chronic and transitory. In an initial categorization, Hulme and Shepherd (2003) define five groups (labeled specific categories) according to the location of the household poverty indicator observed in a point of the time series (henceforth known herein as punctual) and of the average poverty indicator (tendency of the observed household poverty indicator in the time series). The poverty indicator can be in terms of income, expenditure, consumption, assets, nutrition, or combinations of indicators such as a household level human deprivation index (Hulme and Shepherd, 2003). In this article, we use the household income as the household poverty indicator, the only indicator available on data from PME.

Thus, the specific categories are: *always poor* (SP), whose punctual poverty indicator for each time period and average poverty indicator are below the poverty line; *usually poor* (UP), whose average poverty indicator is below the poverty line, but are not poor in all time periods; in other words, the punctual poverty indicator is above the poverty line at some point in time (in this paper, they are the groups that crossed the poverty line only once); *churning poor* (RP), whose average poverty indicator hugs the poverty line, but they can be poor in some time periods and non-poor in others; *occasionally poor* (OC), with the average poverty indicator above the poverty line but they lived at least one time period in poverty; and *never poor* (NP), whose average poverty indicator and punctual indicator are both always above the poverty line.

These categories can be clustered into: *chronically poor* (CP), a junction of *always poor* and *usually poor*; *transitorily poor* (TP), a junction of *churning poor* and *occasionally poor*; and the non-poor (NP), a category of *never poor* families.

Hulme and Shepherd (2003) argue that five years is a suitable time frame for the chronic and transient poverty categories, as this would be a significant time frame in individual life cycle of different cultures. Moreover, empirical studies have found that families who remain in poverty for five or more years have a high probability of remaining in that situation for a lifetime.

Therefore one limitation of this paper is that PME only presents observations with a maximum interval of 16 months and it is not possible to apply the categories for a horizon of five years. Also, because this panel has a high attrition between the 1st and 16th observations, we use two observations for each family with an interval of 12 months. The consequence of this shorter time horizon is that the categories *churning poor* and *occasionally poor* are clustered as aggregate, as both categories deal with the same research units.

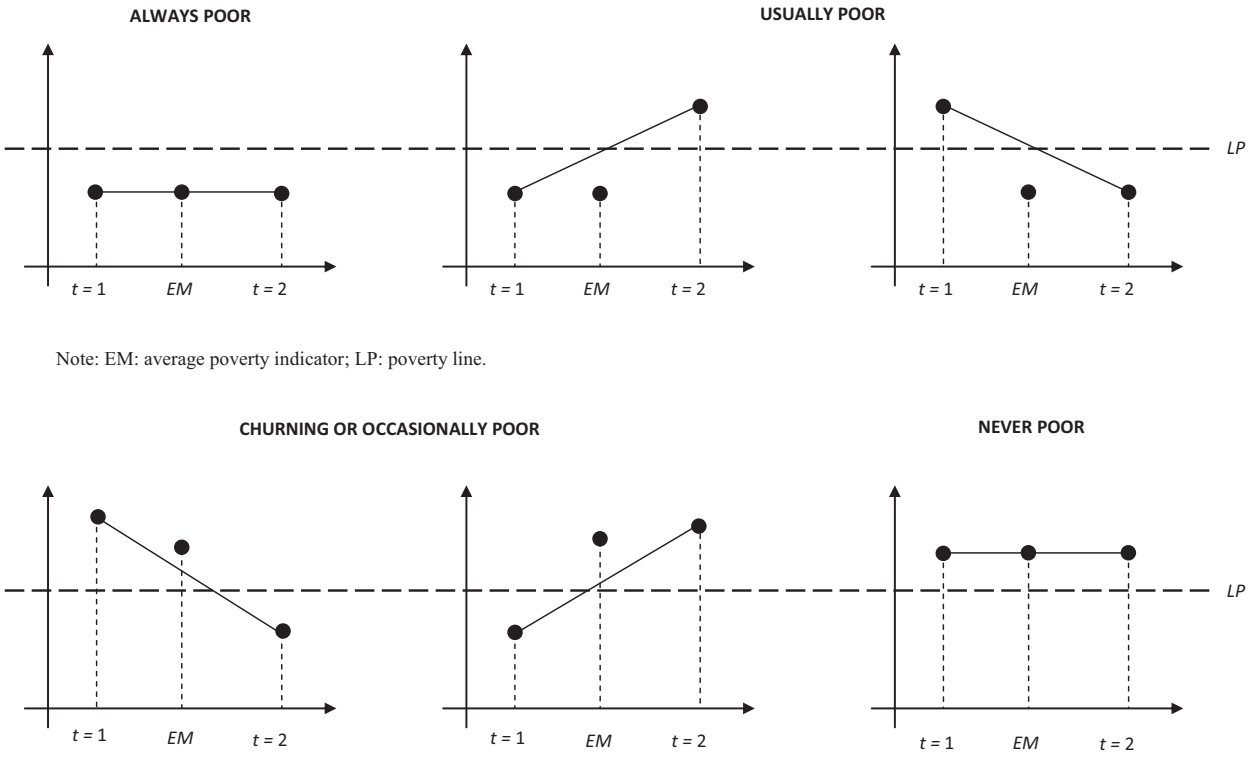
Thus, in our paper, the carried out categorization based on the Hulme and Shepherd's discussion (2003) could be illustrated in Fig. 1. In this figure, six simple graphs are presented: the first one is the situation of the Always Poor families; the second and third graphs present the Usually Poor situation; the following two graphs illustrate the situation of the Churning or Occasionally Poor and, finally, the sixth graph is built for the Never Poor families. The dashed line is the chosen poverty threshold (LP) and the black points show the location of household income in period 1 and 2 and the location of the average income (EM) of the household.

This paper seeks to show the factors associated with each of these typology categories adapted from Hulme and Shepherd (2003). It also suggests public policies dealing with their specificities, striving to increase family welfare in each category.

3. Methodological aspects

3.1. Database and variables

Our chosen database is IBGE's Monthly Job Survey (PME/IBGE), a monthly household longitudinal survey that investigates urban demographic characteristics in the major Brazilian metropolitan regions of Recife, Salvador, Belo



Note: EM: average poverty indicator; LP: poverty line.

Fig. 1. Adaptation of Hulme and Shepherd's categorization (2003).

Horizonte, São Paulo, Rio de Janeiro and Porto Alegre. PME's main objective is to produce monthly labor-force indicators, in order to evaluate metropolitan labor-market fluctuations and trends, making it possible to analyze relations between the labor market and the workforce, associated to other socioeconomic aspects of the population (IBGE).

Yet, despite the wealth of PME micro-data, that allows dynamic phenomena to be investigated, this survey does have some constraints. The first one is sample coverage, limited to only six metropolitan regions (roughly 25% of the Brazilian population and rural areas are not included). Its second limitation is the impossibility to observe all sample individuals in the eight interviews – in other words, PME is not a balanced survey. Individual geographic mobility, refusal to be interviewed and information imprecision are the chief causes, as PME does not report codes for individuals in the households, according to Ribas and Soares (2008).

To minimize such problems, the data collected undergo a double treatment. Firstly, a methodology is used to rescue sample individuals through an algorithm – more advanced than the one conventionally used – developed by Ribas and Soares (2008). Secondly, an attempt is made to minimize the problem of sample exclusion on account of geographical change,[2] by maintaining the families where individuals are replaced or their number decreases (in one of the observations/periods) in a proportion less than or equal to half their total membership.

So as to investigate labor market and workforce conditions, the PME questionnaire includes questions on income from work and does not consider other income sources, such as: pensions, unemployment insurance, rent, investment gains, public and private transfers – that are essential to analyze family welfare and their vulnerability to poverty.

[2] As per the PME methodology, if during the time period that the domicile unit remains in the sample, the family changes its address and another family occupies the domicile unit, for the remaining time period the information will be about the new dweller. Thus, in this paper, the criteria used to evidence a possible geographic change of the family is the decrease (or increase) in family size, for less/more than half the number of family members in the initial observation, or the replacement of more than half the family members by members with different characteristics, between the two interviews. To capture family member substitution, the characteristic used is the calculated age of the individuals. A family is excluded in which over half of its members differ by more than two years in the age declared in the first and second interviews.

Table 1
Family variables used in categorization and in multinomial logit.

	Variable	Description	Type
Demographic	Family size	Number of family members	Q
	Family size > average	Family size above average sample value	B
	Child Proportion	Proportion of family members under age 10	Q
	Elderly Proportion	Proportion of family members aged above or equal to 65 years old	Q
	Economically active prop.	Proportion of family members aged between 18 through 65	Q
Socioeconomic	Prop elemm. schooling[a]	Proportion of elementary- education adults (8 or 9 school years)	Q
	Prop secondary school[b]	Proportion of secondary-education adults (11 or 12 grades)	Q
	Prop college education[c]	Proportion of college/graduate adults (at least 15 school years)	Q
	Prop low qualification[d]	Proportion of workers in low-skilled jobs	Q
	Prop average qualification[e]	Proportion of workers in average qualification jobs	Q
Labor market	Prop high qualification[f]	Proportion of workers in high-skilled jobs	Q
	Prop occupied workers	Proportion of occupied workers in family members aged 18–65	Q
	Prop unemployed workers	Proportion of unemployed among 18–65 family members	Q
	Prop. > 1 year	Proportion of workers over one year in current job	Q
	Prop workers on leave[g]	Presence of workers on sick-leave or laid off due to it	B
	Proportion on formal seg[h]	Proportion of workers in formal economic segments	Q
	Family work hours (aver)	Average weekly hours of family work	Q
	Family work hours > av.	Average weekly hours of family work > sample average	B

Source: Own elaboration based on PME 2002–2011 data (IBGE).
Note: a, b, c, d, e, f, g, h: variables with detailed description in Table A1 (Appendix) herein; Q: quantitative or proportion variable, B: binary variable.

Attempting to minimize this problem, a methodology is used to impute in PME the other household incomes, available in PNAD/IBGE's National Survey of Household Samples. This is an adaptation of Elbers et al. (2003) to transpose variables from one database to another, done by Ribas and Machado (2008).

In this paper, our chosen analysis period ranges from March 2002 through December 2011.[3] Survey units are the household families. Final sample (post-treatment) contains 386.255 families, observed in two time points.

The variables used in the categorization and as variables explaining the multinomial logit estimate (*vide herein below*) are broken down into two groups, namely: (1) Family variables; (2) Head of the family variables. Groups 1 and 2 can be subdivided, as per the variables' nature, into three parts: demographic and socioeconomic variables, and variables that capture labor market insertion.

Inclusion of demographic variables of family members and the head of the family can be justified with the argument that, at the family level, lifecycle factors affecting family structure and composition can impact their welfare level. Moreover, inter-family asymmetries regarding their rights and duties, based on members' gender, age and race/skin color can translate into different ways to deal with and handle economic woes (Moser, 1998).

On the other hand, socioeconomic variables aim at capturing human capital development (of the family members and their head). Indeed, Christiaensen and Boisvert (2000) argue that family human capital – the main determinant of its income level – is incorporated into its members' characteristics, such as their skills and educational level. Lastly, inclusion of the variables of access and insertion into the labor market can be justified, as work (or to have a job) may be considered a poor person's chief asset. Furthermore, in a context of economic problems, a family work portfolio can be managed in such a way as to increase the number of workers, by mobilizing additional work among family members (Moser, 1998).

Tables 1 and 2 herein below display charts with, respectively, the variables for family members and for the head of the family (these variables were constructed and used in this paper). A detailed description of some variables is found in Appendix Table A1 herein.

[3] 16 panels (sets of domicile units) are used in PME: C, D, E, F, G, H, I, J, K, L, M, N, O, P. Panel P uses the families with, at least, the fifth interview (December 2011).

Table 2
Head-of-family variables used in categorization and in multinomial logit.

Head-of-family variables used in categorization and in multinomial logit			
Nature	Variable	Description	Type
Demographic	Family head age	How old the family head is	Q
	Caucasian family head	Indicates whether family head is white	B
	Household head	Indicates whether the family head's gender is male	B
Socioeconomic	Married family head	Indicates family head's marital status	B
	Fam head schooling (yrs)	Indicates family head's educational status (years of study)	Q
	Fam head qualification	Family head's work qualification and skills level	C
Labor market	Occupation status	Family head's occupational status (category variable: value 1 occupied; value 2 unemployed; value 3 inactive)	C
	FH > 1 yr in current job	Indicates current job has been held for over one year	B
	FH in formal segments	Indicates job in formal segments of the economy	B

Source: Own elaboration based on PME 2002–2011 data (IBGE).
Note: Q: quantitative or proportion variable, B: binary variable, C: categorical variable.

The poverty line selected to identify who are the poor is defined as absolute, administrative and is the cutoff established by Brazil's federal government for applicants to qualify and be eligible to receive a *Bolsa Família* – vide Programa Bolsa Família (PBF) herein.[4]

Osorio et al. (2011) defend the use of a "political-administrative" poverty line such as the PBF cutoff, arguing that, in the public policy realm, the perceptions of those who research poverty and its normative decisions cannot replace consensus-based consolidated perceptions.

3.2. The econometric strategy: multinomial logit use

Multinomial logit is a model of discreet choices, in which the dependent variable assumes more than two results and these present no natural ordering. This model is indicated to model the (relative) probability of belonging to one of Hulme and Shepherd's categories, for although the classification establishes a situation of chronic poverty, transitory poverty and non-poverty, this is based on family income information at two time points, as compared to an established poverty line, and there is no ordering of the poverty categories. In other words, it is not possible to verify whether one privation situation is better than another one (or not).

The dependent variable in estimating multinomial logit is categorical and consists of Hulme and Shepherd's classification (2003): *Always poor, Usually poor, Churning or Occasionally poor, and Never poor*. Thus, the dependent variable can present four values and the chosen base category is *Never poor*, as the three other possible family classifications are either chronic or transitory poor.

Hence, the dependent variable takes on value 1 if the family is Always poor, 2 if it is Usually poor, 3 if it is Churning or Occasionally poor, and 4 if the family is Never poor. The values selected to represent the categories are arbitrary and the $1<2<3<4$ ordering does not mean that result 1 is any worse than results 2 or 3. In the multinomial logit model, a set of coefficients β_1, β_2, β_3 and β_4, is estimated corresponding to each result.

Herein below is an example of when the dependent variable takes on a value equal to 1:

$$Pr(y=1)=\frac{\exp(X\beta_1)}{\exp(X\beta_1)+\exp(X\beta_2)+\exp(X\beta_3)+\exp(X\beta_4)}$$

in which "exp" is the abbreviation for the exponential of each one of the coefficients. Only the numerator is altered in the other probabilities, being replaced by the $X\beta$ exponential in the respective category, that is, 2, 3 and 4.

[4] As the *Bolsa Família* Program was implemented only in 2004, for the years 2002 and 2003, the *Bolsa Escola* eligibility criterion is used herein. The monetary amounts for this line are monthly corrected by INPC – National Index of Prices to Consumers (available in website http://www.ipeadata.gov.br/). The eligibility criterion was adjusted by the Brazilian government in 2007 and 2009.

However, the model is not identified, inasmuch as there is more than one solution for β_1, β_2, β_3 and β_4 leading to the same probabilities for $y=1$, $y=2$, $y=3$ and $y=4$. In order to identify the model, it becomes necessary to arbitrarily pick one of the categories for which the coefficient will equal zero.

In this paper, our chosen category is Never poor; therefore, we have $\beta_4=0$. Hence, the other coefficients now will measure the change relative to the group with $y=4$, and present distinct values, as they have different interpretations, but the probability predicted for $y=1$, $y=2$, $y=3$ and $y=4$ will be the same. Ergo, this parametrization is the solution for the model. As for $\beta_4=0$, its probability equations can be described as:

$$Pr(y=1)=\frac{\exp(X\beta_1)}{\exp(X\beta_1)+\exp(X\beta_2)+\exp(X\beta_3)+1}$$

$$Pr(y=2)=\frac{\exp(X\beta_2)}{\exp(X\beta_1)+\exp(X\beta_2)+\exp(X\beta_3)+1}$$

$$Pr(y=3)=\frac{\exp(X\beta_3)}{\exp(X\beta_1)+\exp(X\beta_2)+\exp(X\beta_3)+1}$$

$$Pr(y=4)=\frac{1}{\exp(X\beta_1)+\exp(X\beta_2)+\exp(X\beta_3)+1}$$

The relative probability of $y=1$ for the base result 1, or the relative risk, can be calculated as: $\Pr(y=1)/\Pr(y=4)=\exp(X\beta_1)$. One of the multinomial logit model's major upsides is the possibility of including continuous and categorical variables in the model (Greene, 2012, p. 763–766).

4. Results

4.1. Descriptive analyses of Hulme and Shepherd's categorization

Tables 3 and 4 herein demonstrate the heterogeneity of the poor families in the sample, that is, how families with a high degree of privation can display distinct demographic and socioeconomic characteristics, to be taken into due account whenever public policies are drawn up. In this context, vide a profile analysis of the families in each of the specific and aggregate categories proposed by Hulme and Shepherd (2003).

The inter-category differences are visible in the demographic structure of the families. The proportion of children is higher in the *always* and *usually poor* categories, while the elderly and the economically active hold the lion's share among the *occasionally* and *never* poor. In the variables regarding schooling of family members and family head, adults with secondary and college education predominate among the *occasionally* and *never* poor. There is also disparity in the variables capturing access to and insertion into the labor market, the last two categories with significantly more members working, over one year in the job, and formally employed. Furthermore, families in the first two categories (*always* and *usually* poor) have a lesser proportion of whites (Caucasian), more unemployed, which could also be related to greater incidence and time of unemployment of family members, less weekly average of working hours, a head of household with average age and fewer years of study.

Table 4 herein confirms the above-mentioned heterogeneity when a more aggregate classification is used: families in chronic poverty (junction of specific categories, *always* and *usually* poor), transitory poverty (*churning* or *occasionally* poor) and *never poor* families.

Chart 1 herein shows that in Northeast Brazil's metropolitan regions (Recife and Salvador) a predominance is found of *always poor* and *usually poor* families (chronic poverty), while *never poor* families appear in a lesser proportion. On the other hand, in Southeast Brazil's metropolitan regions (Belo Horizonte, Rio de Janeiro and São Paulo) the poverty categories are better distributed – that is, the types of chronic and transitory privation have a similar proportion among families, and the *never poor* families predominate. Finally, Porto Alegre's metropolitan region (in Brazil's Southern-most state) has the lowest percentages of families in each of the poverty categories and the highest proportion of never poor families.

Table 3
Average of family and family head variables, broken down by specific Hulme and Shepherd category (2003).

Variable	Always poor	Usually poor	Churning or occasionally poor	Never poor
Family size	4	4	3	3
Family size > average	73.4%	77.8%	57.4%	62.3%
Child proportion	27.0%	23.7%	12.6%	9.0%
Elderly proportion	2.8%	3.3%	12.0%	12.6%
Econom. active age prop.	31.0%	37.7%	54.6%	66.4%
Elementary school proportion	39.5%	42.2%	51.3%	66.8%
Secondary school proportion	19.3%	20.4%	32.2%	50.1%
College/graduate proportion	2.2%	0.9%	6.3%	15.3%
Low qualification proportion	29.1%	34.9%	27.9%	27.8%
Medium qualification prop.	4.9%	7.9%	10.6%	22.1%
High qualification proportion	18.9%	21.8%	23.1%	36.9%
Occupied workers proportion	5.5%	10.1%	19.8%	41.0%
Proportion of > 1 year on job	26.3%	30.3%	34.4%	62.5%
Proportion of unemployed	18.1%	16.6%	11.1%	4.3%
Proportion of formal work	14.9%	23.3%	27.0%	51.8%
Proportion on-leave workers	0.4%	0.4%	0.3%	0.2%
Family working hours	6	9	12	21
Working hours > average	6.2%	14.0%	25.8%	56.5%
Family head's age	39	40	47	49
Caucasian family head	36.4%	36.8%	50.2%	60.9%
Household head	47.8%	52.9%	53.0%	65.8%
Married family head	49.6%	57.8%	49.9%	64.2%
Family head's qualification	0.9	1.1	1.0	1.3
Family head's occup. status	2.0	1.9	2.0	1.6
Family head's schooling	6	6	7	8
FH > 1 year on job	28.5%	33.7%	39.2%	72.6%
Formal family head	69.0%	80.1%	72.9%	99.1%

Source: Own elaboration based on PME 2002–2011 data (IBGE).

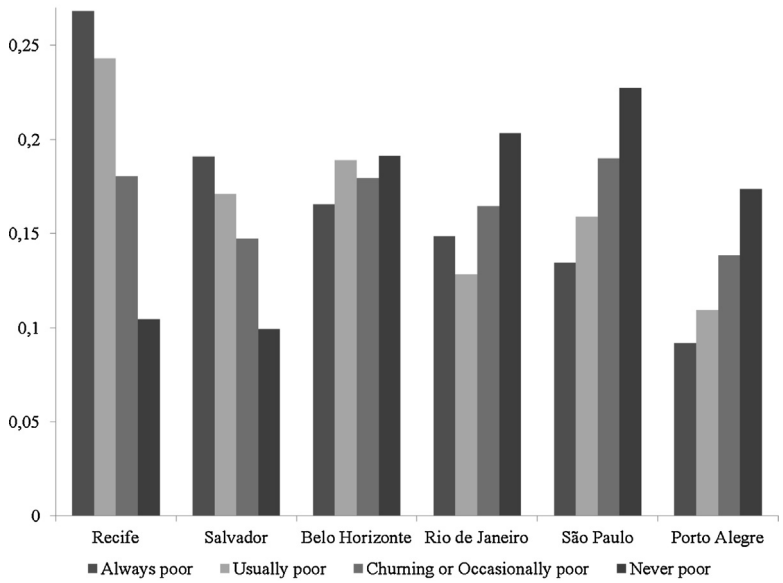


Chart 1. Hulme and Shepherd's (2003) specific categories, by Metropolitan Regions.
Source: Own elaboration based on PME 2002–2011 data (IBGE).

Table 4
Average of family and family head variables, broken down by aggregate Hulme and Shepherd category (2003).

Variable	Chronic poor	Transitory poor	Never poor
Family size	4	3	3
Family size > average	75.3%	57.4%	62.3%
Child proportion	25.6%	12.6%	9.0%
Elderly proportion	3.0%	12.0%	12.6%
Econom.-active age prop.	33.8%	54.6%	66.4%
Elementary school proportion	36.7%	49.9%	60.6%
Secondary school proportion	43.8%	43.2%	46.8%
College/graduate proportion	40.6%	51.3%	66.8%
Low qualification proportion	19.7%	32.2%	50.1%
Medium qualification prop.	1.7%	6.3%	15.3%
High qualification proportion	31.6%	27.9%	27.8%
Occupied workers proportion	6.2%	10.6%	22.1%
Proportion of > 1 year on job	20.2%	23.1%	36.9%
Proportion of unemployed	7.5%	19.8%	41.0%
Proportion of formal work	28.0%	34.4%	62.5%
Proportion on-leave workers	17.5%	11.1%	4.3%
Family working hours	18.5%	27.0%	51.8%
Working hours > average	0.4%	0.3%	0.2%
Family head's age	7	12	21
Caucasian family head	9.5%	25.8%	56.5%
Household head	39	47	49
Married family head	36.6%	50.2%	60.9%
Family head's qualification	49.9%	53.0%	65.8%
Family head's occup. status	53.1%	49.9%	64.2%
Family head's schooling	1.0	1.0	1.3
FH > 1 year on job	2.0	2.0	1.6
Formal family head	6	7	8

Source: Own elaboration based on PME 2002–2011 data (IBGE).

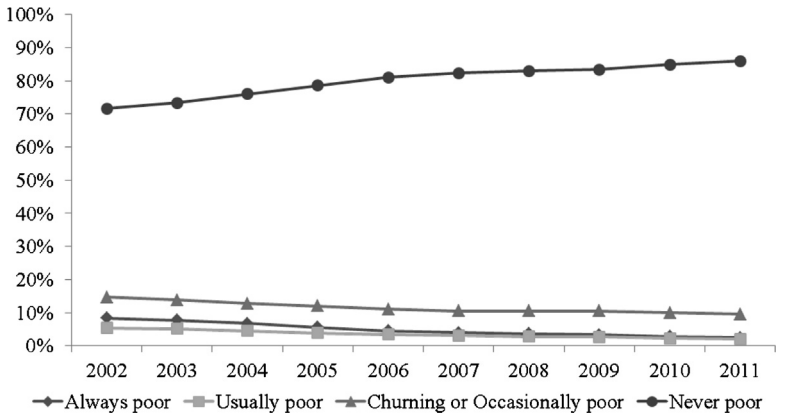


Chart 2. Evolution of family percentage in each Hulme and Shepherd's (2003) specific category (2002–2011).
Source: Own elaboration based on PME 2002–2011 data (IBGE).

Chart 2 herein shows the evolution of family percentage in each of Hulme and Shepherd's (2003) specific categories, from 2002 through 2011. Both the percentage of families in chronic poverty (*always poor* and *usually poor*) as well as in transitory poverty (*churning* or *occasionally poor*) decline from 2002 through 2011. On the other hand, the proportion of *never poor* families grows during the nearly entire same time period. These results are related to an increase in the average income of the Brazilian population which, in turn, might be due to consecutive increases in the national

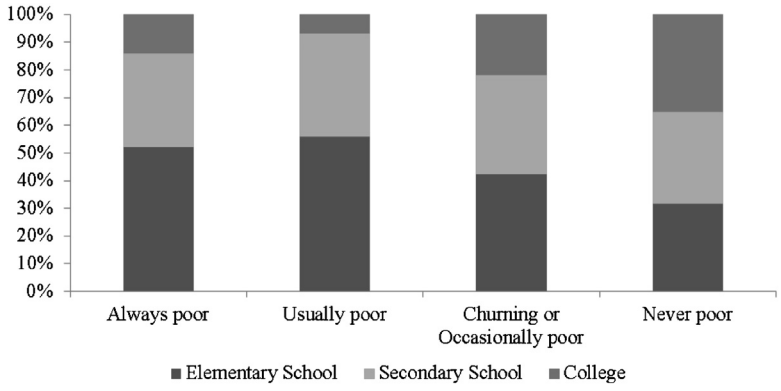


Chart 3. Head of family schooling, in each Hulme and Shepherd's specific category (2003).
Source: Own elaboration based on PME 2002–2011 data (IBGE).

minimum wage (it has practically doubled in real terms), and to a federal policy of increased income transfers (the *Bolsa Família* program expansion is a case in point, as is higher-paid job salaries.[5]

Family distribution in each specific category of poverty, as per the family head's schooling level (see Chart 3 herein), demonstrates that family heads with elementary schooling are more present among the *Always Poor* and *Usually Poor*, that is, in chronic poverty families. The proportion of college-educated heads of families is significant among the *Churning* or *Occasionally Poor* and in the *Never Poor* families. This same chart suggests evidence of a relation between chronic poverty and family structural problems, that is, low incomes relate to lesser schooling.

On the other hand, transitory poverty would be less related to structural issues, as *Churning* and *Occasionally Poor* families are headed by someone with full secondary schooling and college education. Therefore, this situation must be associated to family income volatility, possibly caused by unexpected shocks and factors such as unemployment, fewer sales and less hours worked by autonomous/freelancers.

4.2. Results of multinomial logit estimation

Tables 5 and 6 herein have the results of the multinomial logit estimation. For the sake of better visualization and interpretation of these results, the tables contain only the relative risk ratio (RRR) or odds ratio, interpreted as the odds of a family being *Always Poor*, *Usually Poor*, or *Churning* or *Occasionally Poor* as compared to its odds of being *Never Poor* (the benchmark category) for the full model, dummies being included for trend or conjunctural effects in the years researched. If this ratio is greater than 1 for any variable's impact, it is possible to conclude that this variable raises the family's odds of belonging to this category, as compared to the benchmark base-category *Never Poor*.

This paper's appendix (herein below) includes the estimated results for all models tested. The first column (model M1) has the regression results with controls only for PME's Metropolitan Regions - in other words, dummy variables are included to control each Metropolitan Region's specific characteristics, but trend or macro effects are not considered for the months of the year or for the years upon which the base is built (2002–2011). The second column (M2) has the estimated results with controls for the Metropolitan Regions and for the seasonal effects in the months of the year.

It is possible to verify in Table 5 herein that family size, proportion of children and of unemployed among family members increase the probability of the family being *Always Poor*, *Usually Poor*, and *Churning* or *Occasionally Poor* vis-à-vis the probability of it being *Never Poor*. On the other hand, it is also possible to verify that a greater proportion of elderly, of family members in an economically-active age bracket, adults with secondary and college education, a higher proportion of average or highly-qualified skilled workers lessen the probability of the family being *Always Poor*, *Usually Poor*, and *Churning* or *Occasionally Poor*, compared to the probability of it being *Never Poor*. Moreover, the proportion of formally occupied workers and a higher number of average family working hours also decrease the odds of the family belonging to these chronic and transitory poverty categories, as compared to the odds of it being *Never Poor*.

[5] Formal jobs in Brazil grew approximately 61% in 2002–2011 (RAIS, MTE).

Table 5
Multinomial logit results for family variables.

	Always poor	Usually poor	Churning or occasionally poor
Family size	1,595	1,342	1,172
	(0.016)	(0.014)	(0.009)
Family size > average	0.553	0.911	0.691
	(0.019)	(0.033)	(0.014)
Child proportion	3,230	2,426	1,378
	(0.192)	(0.154)	(0.057)
Elderly proportion	0.112	0.111	0.355
	(0.009)	(0.010)	(0.012)
Active age prop.	0.640	0.639	0.877
	(0.021)	(0.023)	(0.018)
Fundamental school prop.	0.643	0.743	0.856
	(0.025)	(0.030)	(0.020)
Secondary school prop.	0.581	0.552	0.734
	(0.024)	(0.023)	(0.017)
College/graduate prop.	1,082	0.186	0.875
	(0.082)	(0.025)	(0.028)
Low qualif. proportion	0.839	0.884	0.697
	(0.045)	(0.047)	(0.021)
Mid qualif. proportion	0.437	0.575	0.462
	(0.028)	(0.036)	(0.015)
High qualif. proportion	0.672	0.675	0.541
	(0.040)	(0.041)	(0.018)
Prop. of occupied workers	1,287	1,438	1,051
	(0.108)	(0.118)	(0.042)
Prop. of unemployed workers	1,728	2,106	1,932
	(0.080)	(0.101)	(0.059)
Proportion > 1 year	2,482	1,881	1,420
	(0.239)	(0.165)	(0.061)
Prop. of on-leave workers	1,209	1,210	1,208
	(0.185)	(0.204)	(0.122)
Prop. on formal work	0.260	0.354	0.465
	(0.011)	(0.015)	(0.011)
Working hours	0.907	0.933	0.979
	(0.003)	(0.003)	(0.001)
Work hours > average	0.678	0.869	0.647
	(0.037)	(0.042)	(0.014)
Metropolitan Region	Sim	Sim	Sim
Month	Sim	Sim	Sim
Year	Sim	Sim	Sim
Constant	4.617***	3.236***	2.777***
	(0.133)	(0.137)	(0.0787)
Number of observations	38.5945	385.945	385.945

Source: Own elaboration based on PME 2002–2011 data (IBGE).
* p-value < 0.05.
** p-value < 0.01.
*** p-value < 0.001.

A counter-intuitive result deserving a more in-depth study is the fact that workers more than one year on the job also have a higher probability of belonging to one of these same three categories, as tenure on the job may be evidence of more stability in the labor market and ensure greater income safety to the family. However, a caveat is in order: tenure on the job does not necessarily translate into progress in the worker's activity nor into salary increases. Another variable with unexpected odds is the proportion of occupied workers increasing the probability of the family belonging to the *Always Poor* and *Usually Poor* categories.

Table 6
Multinomial logit results for head of family variables.

	Always poor	Usually poor	Churning or occasionally poor
Family head age	0.933	0.950	0.973
	(0.001)	(0.001)	(0.001)
Caucasian family head	0.846	0.789	0.929
	(0.019)	(0.018)	(0.012)
Household head	0.875	0.808	0.932
	(0.000)	(0.000)	(0.000)
Married family head	0.492	0.679	0.614
	(0.000)	(0.000)	(0.000)
Family head education	0.929	0.941	0.970
	(0.000)	(0.000)	(0.000)
Family head qualification	0.913	0.960	0.914
	(0.000)	(0.000)	(0.000)
Family head occupational status	0.958	0.918	0.917
	(0.000)	(0.000)	(0.000)
Family head for > 1 year	0.205	0.262	0.442
	(0.000)	(0.000)	(0.000)
Formal family head	0.925	0.854	0.889
	(0.000)	(0.000)	(0.000)
Metropolitan Region	Yes	Yes	Yes
Month	Yes	Yes	Yes
Year	Yes	Yes	Yes
Constant	4.617***	3.236***	2.777***
	(0.133)	(0.137)	(0.0787)
Number of observations	385.945	385.945	385.945

Source: Own elaboration based on PME 2002–2011 data (IBGE).
* p-value < 0.05.
** p-value < 0.01.
*** p-value < 0.001.

Table 6 investigates the effects of some characteristics of the family head on the odds of the family belonging to Hulme and Shepherd's specific categories (2003). Families headed by someone older run a smaller risk of belonging to the categories analyzed. In addition, higher-qualified more-schooled heads of family, who are Caucasian males, married and with longer job stability (over a year on the job and in formal sectors) ensure a lesser probability of the family being in chronic and transitory poverty.

4.3. Comparison with the results of Hulme and Shepherd's work (2003)

Hulme and Shepherd's work (2003) does not present the magnitude of each category in a specific database and the authors do not use the categories of chronic and transient poverty to calculate probabilities of belonging to each category. However, by categorizing the families of Bangladesh, these authors provide a qualitative analysis of the most strongly factors related to chronic and transitory poverty.

They use a questionnaire about the current situation of families (category of poverty to which the family belongs) and the situation of the same families in the past decade, as well as questions about the ownership of assets, access to the labor market, education and health. The authors note that this analysis is only illustrative, since its conclusions stem from the response of families that can be wrong about distant events in time. However, they verified that the assets of the families have an important role in determining the poverty categories. Due to a limitation of the PME data, that do not presents information about assets, it is not possible understand if this would also be a predominant factor in determining the chronic poverty in Brazilian Metropolitan Areas.

Similar to our results, Hulme and Shepherd found that education is an important factor for the downward and upward mobility of families, since education is the main asset to access and insertion into the labor market.

5. Conclusions

The categories proposed by Hulme and Shepherd (2003) show that, despite an across-the-board status decline in all poverty categories in the past decade, *Always Poor* or *Usually Poor* families' demographic, socioeconomic, access to and insertion into the labor market characteristics are distinct from families in transitory poverty or classified as *Never Poor*. For those *Always Poor* families, considering their higher proportion of children, households headed by females (single mothers), less schooling and smaller extensive and intensive labor market participation – to be occupied and working hours, respectively – for them, social policies should bring relief to the vicious circle of poverty, should focus on expanding the number of child daycare centers in vulnerable areas, on worker enablement and qualification programs, on activities toward more female participation in the labor market, and on programs guiding labor market insertion, in addition to income-transfer programs. As for the *Usually Poor*, albeit some indicators point to a better position than the previous group herein above, similarities suggest the same content in policy formulation. Both groups, as was said before, comprise the Chronically Poor.

Among the transitory poor (named *Churning* or *Occasionally Poor* by Hulme and Shepherd (2003)), there are more elderly and work conditions are more favorable, as families have less unemployed members as well as more formal jobs and working hours. All of this calls for active labor market policies, that is, expansion of time-to-market access and monetary amounts of unemployment insurance that minimize income losses brought about by economic ups and downs, and – in the case of autonomous/freelance workers – easier credit access and management, aimed at hard times of greater income vulnerability, as well as labor enablement and qualification, so as to reduce possible incompatibility between labor skills and work demand.

As the Metropolitan Regions in the Brazilian Northeast (Salvador and Recife) have the highest percentages of chronic and transitory poor, they should be the focus of public policies seeking to relieve poverty.

Multinomial logit estimated results point to families with more members and a greater proportion of children having a higher (relative) probability of being in chronic and transitory poverty. On the other hand, families whose members have completed secondary school and/or college, or enjoy a higher level of work skills face fewer odds of falling into poverty and remaining poor for, at least, one year.

It is thus possible to conclude that the demographic transition phenomenon, also plaguing the poor and implying a decrease in child dependency ratio (ratio between the number of children and the number of family members in the economically active age bracket) can lessen the incidence of chronic and transitory poverty in Brazil. It is also possible to reach the same conclusion regarding incentive policies for completion of secondary education and of college access – two other poverty-fighting pathways.

Appendix.

Tables A1–A4

Table A1
Detailed description of some variables.

Variable	Description
Elementary	Adults as high school freshmen or attending a shorter complementary high school course or junior-high level (not a grade/year) or completed a junior-high fourth year (circa 9TH grade) or have completed the first 'fundamental' schooling level or the 2nd cycle (pre-college) without concluding it, or mid-high school, again without course conclusion.
Mid high	Adults attending mid-high secondary 4th grade or pre-college preparation for CEE (college entrance exam) or are enrolled as college freshmen or are still in the 12th grade, or are juniors or seniors or have completed high school or have been college freshmen or sophmores (under grad) or have concluded a course's first year.
College/Grad school	Adults attending or having attended Master's or PhD or who attended and completed some under-grad course.
Low or manual qualification	Cluster of CNAE classification categories (National Classification of Economic Activities, IBGE): 105, 106, 107, 108, 109, 110, 111, 112, 61, 62, 63, 64, 71, 72, 73, 74, 75, 76, 81, 82, 83, 84, 86, 87.
Medium qualification	Cluster of CNAE classification categories (National Classification of Economic Activities, IBGE): 103, 30, 31, 32, 33, 104, 34, 35, 37, 39, 41, 42, 95.

Table A1 (*Continued*)

Variable	Description
High or college qualification	Cluster of CNAE classification categories (National Classification of Economic Activities, IBGE): 100, 11, 12, 13, 101, 102, 26, 51, 77, 78, 91, 99, 1, 2, 3, 4, 5.
Hold job in formal segments	Workers with signed work document, military personnel or one-legal-regimen employees, employers with more than six employees, liberal professionals (work on their own but are college educated or graduates - excluding air, sea and river navigation, communication, arts and members of religious cults), professionals in air, sea and river navigation or in communication, shows/spectacles and arts.
On sick leave or layoff	Workers laid off from their own undertaking, due to pregnancy, sickness or accident, not paid by pension or welfare, employees with private-sector signed work document, on unpaid leave.

Table A2
Multinomial logit results (Always poor × Never poor).

	M1	M2	M3	Odds ratio (M3)
Family size	0.470***	0.470***	0.467***	1,595
	(0.00976)	(0.00977)	(0.00980)	(0.016)
Family size > average	−0.583***	−0.585***	−0.593***	0.553
	(0.0336)	(0.0336)	(0.0338)	(0.019)
Child proportion	1.234***	1.233***	1.173***	3,230
	(0.0590)	(0.0590)	(0.0593)	(0.192)
Elderly proportion	−2.165***	−2.171***	−2.188***	0.112
	(0.0816)	(0.0817)	(0.0819)	(0.009)
Active age prop.	−0.417***	−0.420***	−0.446***	0.640
	(0.0326)	(0.0326)	(0.0327)	(0.021)
Fundamental school prop.	−0.462***	−0.458***	−0.441***	0.643
	(0.0383)	(0.0383)	(0.0385)	(0.025)
Secondary school prop.	−0.594***	−0.590***	−0.544***	0.581
	(0.0403)	(0.0403)	(0.0405)	(0.024)
College/graduate prop.	0.123	0.122	0.0791	1,082
	(0.0756)	(0.0757)	(0.0760)	(0.082)
Low qualif. proportion	−0.183***	−0.184***	−0.175***	0.839
	(0.0529)	(0.0529)	(0.0531)	(0.045)
Mid qualif. proportion	−0.783***	−0.787***	−0.828***	0.437
	(0.0639)	(0.0639)	(0.0641)	(0.028)
High qualif. proportion	−0.380***	−0.381***	−0.398***	0.672
	(0.0596)	(0.0597)	(0.0599)	(0.040)
Prop. of occupied workers	0.224**	0.230**	0.252**	1,287
	(0.0839)	(0.0839)	(0.0842)	(0.108)
Prop. of unemployed workers	0.604***	0.597***	0.547***	1,728
	(0.0462)	(0.0463)	(0.0465)	(0.080)
Proportion > 1 year	0.923***	0.923***	0.909***	2,482
	(0.0959)	(0.0960)	(0.0962)	(0.239)
Prop.of on-leave workers	0.164	0.171	0.190	1,209
	(0.152)	(0.152)	(0.153)	(0.185)
Prop. on formal work	−1.357***	−1.358***	−1.348***	0.260
	(0.0441)	(0.0441)	(0.0443)	(0.011)
Working hours	−0.0970***	−0.0971***	−0.0977***	0.907
	(0.00315)	(0.00315)	(0.00316)	(0.003)
Work hours > average	−0.376***	−0.379***	−0.389***	0.678
	(0.0539)	(0.0540)	(0.0541)	(0.037)
Head of family's age	−0.0700***	−0.0700***	−0.0694***	0.933
	(0.00106)	(0.00106)	(0.00106)	(0.001)
Caucasian family head	−0.135***	−0.136***	−0.167***	0.846
	(0.0218)	(0.0218)	(0.0219)	(0.019)
Household head	−0.0898**	−0.0920***	−0.134***	0.875
	(0.0274)	(0.0274)	(0.0277)	0.000
Married family head	−0.711***	−0.712***	−0.708***	0.492
	(0.0295)	(0.0295)	(0.0298)	0.000

Table A2 (*Continued*)

	M1	M2	M3	Odds ratio (M3)
Head of family's schooling	−0.0765***	−0.0768***	−0.0736***	0.929
	(0.00450)	(0.00450)	(0.00451)	0
Head of family's qualification	−0.0894***	−0.0889***	−0.0909***	0.913
	(0.0255)	(0.0255)	(0.0256)	0
Head of family's occupation	−0.0569	−0.0555	−0.0431	0.958
	(0.0367)	(0.0367)	(0.0369)	0
Family head > 1 year	−1.591***	−1.594***	−1.586***	0.205
	(0.0928)	(0.0929)	(0.0931)	0
Formal family head	−0.0896*	−0.0883*	−0.0782	0.925
	(0.0430)	(0.0431)	(0.0432)	0
Metropolitan Region	Sim	Sim	Sim	Sim
Month	Não	Sim	Sim	Sim
Year	Não	Não	Sim	Sim
Constant	4.137***	4.002***	4.617***	4.617***
	(0.125)	(0.130)	(0.133)	(0.133)
Number of observations	385,945	385,945	385,945	385,945

Source: Own elaboration based on PME 2002–2011 data (IBGE).
* p-value < 0.05.
** p-value < 0.01.
*** p-value < 0.001.

Table A3
Multinomial logit results (Usually poor × Never poor).

	M1	M2	M3	Odds ratio (M3)
Family size	0.299***	0.299***	0.294***	1,342
	(0.0107)	(0.0107)	(0.0107)	(0.014)
Family size > average	−0.0861*	−0.0864*	−0.0932*	0.911
	(0.0365)	(0.0365)	(0.0365)	(0.033)
Child proportion	0.935***	0.934***	0.886***	2,426
	(0.0634)	(0.0635)	(0.0637)	(0.154)
Elderly proportion	−2.177***	−2.182***	−2.200***	0.111
	(0.0886)	(0.0886)	(0.0887)	(0.010)
Active age prop.	−0.422***	−0.423***	−0.448***	0.639
	(0.0356)	(0.0356)	(0.0357)	(0.023)
Fundamental school prop.	−0.317***	−0.314***	−0.298***	0.743
	(0.0404)	(0.0404)	(0.0405)	(0.030)
Secondary school prop.	−0.640***	−0.637***	−0.594***	0.552
	(0.0424)	(0.0425)	(0.0426)	(0.023)
College/graduate prop.	−1.641***	−1.642***	−1.680***	0.186
	(0.136)	(0.136)	(0.137)	(0.025)
Low qualif. proportion	−0.126*	−0.128*	−0.123*	0.884
	(0.0528)	(0.0528)	(0.0528)	(0.047)
Mid qualif. proportion	−0.515***	−0.519***	−0.554***	0.575
	(0.0617)	(0.0618)	(0.0618)	(0.036)
High qualif. proportion	−0.376***	−0.377***	−0.393***	0.675
	(0.0601)	(0.0601)	(0.0602)	(0.041)
Prop. of occupied workers	0.331***	0.334***	0.364***	1,438
	(0.0821)	(0.0822)	(0.0822)	−0.118
Prop.of unemployed workers	0.798***	0.791***	0.745***	2,106
	(0.0479)	(0.0480)	(0.0481)	−0.101
Proportion > 1 year	0.645***	0.645***	0.632***	1,881
	(0.0877)	(0.0877)	(0.0878)	−0.165
Prop. of on-leave workers	0.163	0.170	0.191	1.21
	(0.168)	(0.168)	(0.169)	−0.204
Prop. on formal work	−1.048***	−1.049***	−1.039***	0.354
	(0.0426)	(0.0426)	(0.0427)	−0.015

Table A3 (*Continued*)

	M1	M2	M3	Odds ratio (M3)
Working hours	−0.0685***	−0.0685***	−0.0690***	0.933
	(0.00295)	(0.00295)	(0.00295)	−0.003
Work hours > average	−0.134**	−0.134**	−0.141**	0.869
	(0.0481)	(0.0481)	(0.0482)	−0.042
Head of family's age	−0.0524***	−0.0524***	−0.0518***	0.95
	(0.00114)	(0.00114)	(0.00115)	−0.001
Caucasian family head	−0.208***	−0.209***	−0.237***	0.789
	(0.0231)	(0.0231)	(0.0232)	−0.018
Household head	−0.175***	−0.177***	−0.213***	0.808
	(0.0289)	(0.0290)	(0.0292)	0
Married family head	−0.395***	−0.395***	−0.388***	0.679
	(0.0312)	(0.0313)	(0.0314)	0
Head of family's schooling	−0.0638***	−0.0639***	−0.0613***	0.941
	(0.00475)	(0.00475)	(0.00476)	0
Head of family's qualification	−0.0399	−0.0397	−0.0413	0.96
	(0.0246)	(0.0246)	(0.0247)	0
Head of family's occupation	−0.0960**	−0.0955*	−0.0857*	0.918
	(0.0371)	(0.0371)	(0.0372)	0
Family head > 1 year	−1.344***	−1.345***	−1.339***	0.262
	(0.0843)	(0.0843)	(0.0844)	0
Formal family head	−0.167***	−0.166***	−0.158***	0.854
	(0.0419)	(0.0419)	(0.0420)	0
Metropolitan Region	Sim	Sim	Sim	Sim
Month	Não	Sim	Sim	Sim
Year	Não	Não	Sim	Sim
Constant	2.865***	2.706***	3.236***	3.236***
	(0.128)	(0.134)	(0.137)	(0.137)
Number of observations	385,945	385,945	385,945	385,945

Source: Own elaboration based on PME 2002–2011 data (IBGE).
* p-value < 0.05.
** p-value < 0.01.
*** p-value < 0.001.

Table A4
Multinomial logit results (Churning or Occasionally poor × Never poor).

	M1	M2	M3	Odds ratio
Family size	0.163***	0.163***	0.159***	1,172
	(0.00729)	(0.00729)	(0.00730)	(0.009)
Family size > average	−0.366***	−0.367***	−0.370***	0.691
	(0.0204)	(0.0204)	(0.0204)	(0.014)
Child proportion	0.337***	0.336***	0.321***	1,378
	(0.0412)	(0.0412)	(0.0413)	(0.057)
Elderly proportion	−1.020***	−1.022***	−1.036***	0.355
	(0.0326)	(0.0326)	(0.0327)	(0.012)
Active age prop.	−0.117***	−0.117***	−0.131***	0.877
	(0.0206)	(0.0206)	(0.0206)	(0.018)
Fundamental school prop.	−0.165***	−0.164***	−0.156***	0.856
	(0.0238)	(0.0238)	(0.0239)	(0.020)
Secondary school prop.	−0.336***	−0.334***	−0.310***	0.734
	(0.0231)	(0.0231)	(0.0231)	(0.017)
College/graduate prop.	−0.117***	−0.118***	−0.133***	0.875
	(0.0318)	(0.0319)	(0.0319)	(0.028)
Low qualif. proportion	−0.363***	−0.363***	−0.361***	0.697
	(0.0296)	(0.0296)	(0.0297)	(0.021)
Mid qualif. proportion	−0.754***	−0.755***	−0.771***	0.462
	(0.0326)	(0.0326)	(0.0326)	(0.015)

Table A4 (*Continued*)

	M1	M2	M3	Odds ratio
High qualif. proportion	−0.605***	−0.606***	−0.614***	0.541
	(0.0325)	(0.0325)	(0.0326)	(0.018)
Prop. of occupied workers	0.0262	0.0279	0.0499	1,051
	(0.0398)	(0.0398)	(0.0398)	(0.042)
Prop. of unemployed workers	0.686***	0.682***	0.659***	1,932
	(0.0306)	(0.0306)	(0.0307)	(0.059)
Proportion > 1 year	0.356***	0.355***	0.351***	1,420
	(0.0428)	(0.0428)	(0.0428)	(0.061)
Prop. of on-leave workers	0.170	0.174	0.189	1,208
	(0.101)	(0.101)	(0.101)	(0.122)
Prop. on formal work	−0.768***	−0.769***	−0.765***	0.465
	(0.0233)	(0.0233)	(0.0233)	(0.011)
Working hours	−0.0207***	−0.0208***	−0.0211***	0.979
	(0.00118)	(0.00119)	(0.00118)	(0.001)
Work hours > average	−0.435***	−0.435***	−0.435***	0.647
	(0.0222)	(0.0222)	(0.0222)	(0.014)
Head of family's age	−0.0281***	−0.0281***	−0.0276***	0.973
	(0.000614)	(0.000614)	(0.000616)	(0.001)
Caucasian family head	−0.0566***	−0.0570***	−0.0732***	0.929
	(0.0126)	(0.0126)	(0.0127)	(0.012)
Household head	−0.0553***	−0.0563***	−0.0706***	0.932
	(0.0152)	(0.0152)	(0.0153)	0.000
Married family head	−0.493***	−0.492***	−0.488***	0.614
	(0.0165)	(0.0165)	(0.0166)	0
Head of family's schooling	−0.0315***	−0.0316***	−0.0305***	0.97
	(0.00261)	(0.00261)	(0.00261)	0
Head of family's qualification	−0.0890***	−0.0893***	−0.0896***	0.914
	(0.0134)	(0.0134)	(0.0135)	0
Head of family's occupation	−0.0908***	−0.0913***	−0.0864***	0.917
	(0.0213)	(0.0213)	(0.0213)	0
Family head > 1 year	−0.818***	−0.818***	−0.817***	0.442
	(0.0417)	(0.0417)	(0.0417)	0
Formal family head	−0.121***	−0.121***	−0.117***	0.889
	(0.0231)	(0.0231)	(0.0231)	0
Metropolitan Region	Sim	Sim	Sim	Sim
Month	Não	Sim	Sim	Sim
Year	Não	Não	Sim	Sim
Constant	2.454***	2.402***	2.777***	2.777***
	(0.0741)	(0.0767)	(0.0787)	(0.0787)
Number of observations	385,945	385,945	385,945	385,945

Source: Own elaboration based on PME 2002–2011 data (IBGE).
* p-value < 0.05.
** p-value < 0.01.
*** p-value < 0.001.

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